iPRO 5000™ Series Total Nitrogen/Total Sulfur (TN/TS) Analyzer

Installation Procedure V 1.2

© March 2012 Thermo Fisher Scientific Registration No. 441506 SOLAAR House, 19 Mercers Row, Cambridge CB5 8BZ, United Kingdom. Telephone +44 (0) 1223 347400, Fax +44 (0) 1223 347402,

http://www.thermoscientific.com/iPRO

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1 Introduction

This manual is designed to help ensure that the iPRO 5000 Series TN/TS Analyzer will be installed efficiently. The installation must be carried out by a Thermo Fisher Scientific-trained service engineer. Detailed below is the Installation Procedure for the iPRO 5000 Series TN/TS Analyzer. It is very important that these procedures are followed in the correct order and taking account of the timing required. Failure to do so may result in extended installation and possible damage to the instrument. The procedures and timings are designed to prevent problems with the Thermo Scientific NSX Visual Software, firmware and hardware.

The boxes at the end of each section should be initialled by the installing engineer to indicate completion of the section, before proceeding to the next section.

Example of the box: Section completed:

This manual does not contain information detailing covers and parts removal. This information can be found in the **Repair Details** section.

If there are questions after reading the Installation Procedure, please contact the Technical Support Department of Thermo Fisher Scientific, Cambridge UK on: technicalsupport.sid.cambridge@thermofisher.com

2 Preparations prior to the Installation

To ensure good installation quality make sure the following is prepared prior to the installation:

- Availability of the necessary tools. This information can be found in the **Repair Details** section.
- Availability of standards. This information can be found in the **Pre-Installation Manual**.

3 Instrument Overview

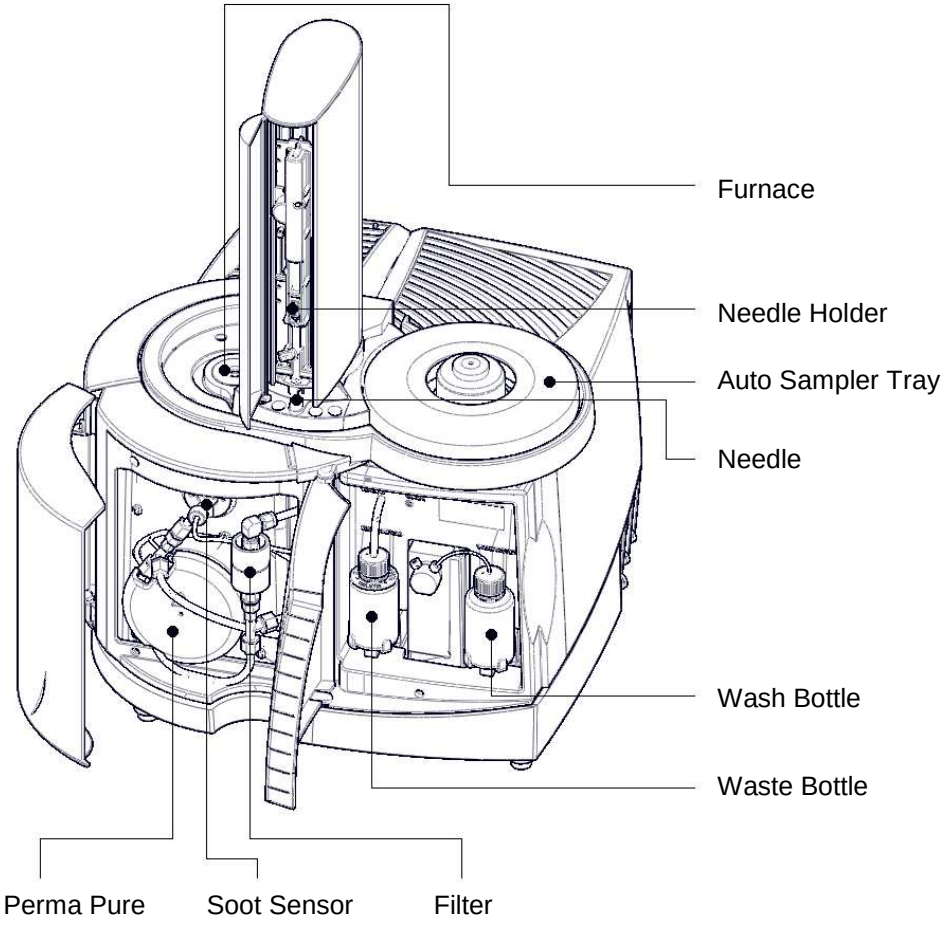


Fig 2.1 Front and top view iPRO 5000 Series TN/TS Analyzer with AS3000 II Autosampler

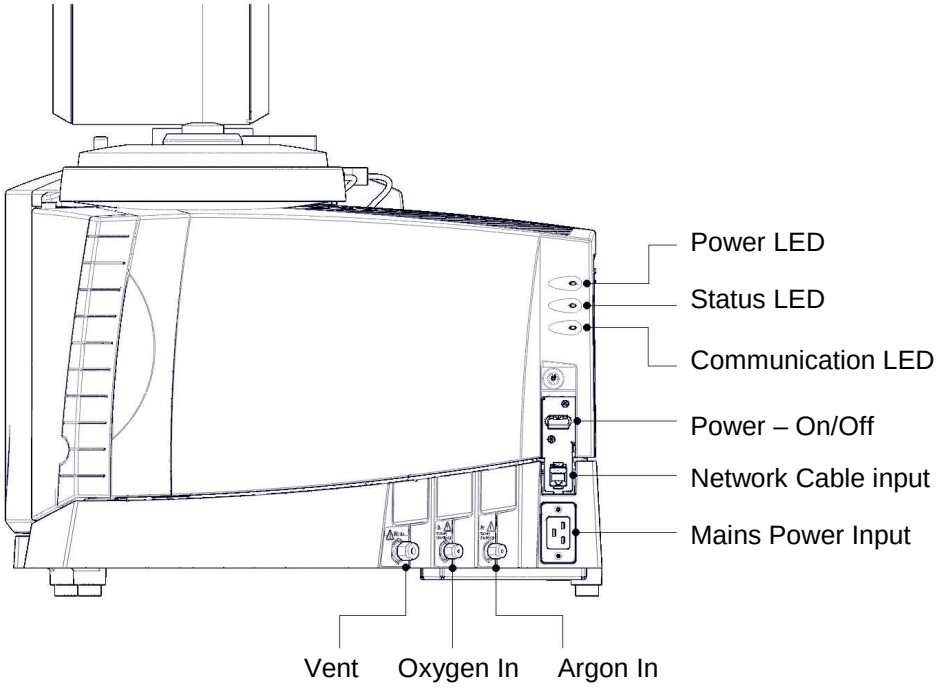


Fig 2.2 Right side view iPRO 5000 Series TN/TS Analyzer with AS3000 II Autosampler

4 Start of the Installation

*Before starting the installation, make sure the **pre-installation requirements** are checked. Failure to do so can result in extended installation and possible damage.*

4.1 Initial Inspection

Check the contents of the shipment for completeness and possible damage in transit. See damage indicators below are correct.

Fig 3.1 Example of a Tip and Tell indicator intact (left) and broken (right)

Fig 3.2 Example of a Tip and Tell indicator intact (left) and broken (right)

If the contents are incomplete or damaged a claim should be filed with the carrier immediately. In order to facilitate repair or replacement the local Thermo Fisher Scientific representative should be notified of any damage and of any items that have not been supplied.

Section completed: ☐

4.2 Packing List

The packing list consists of a number of ancillary items sent with the Instrument and accessories necessary to put the system in operation. In addition a number of consumable items are included which may be used when commissioning the instrument. Check the packing list supplied with the equipment and report deviations if they occur.

Note: See Appendix A below for details of parts that will be shipped with a new instrument.

Section completed: ☐

4.3 Pre-Installation Requirements

Ensure that the requirements detailed in the Pre-Installation Checklist are met in the user's chosen location. See the latest version of the **Pre-Installation Manual** for iPRO 5000 Series TN/TS Analyzer for the exact details. Tick each box and the section complete.

Action	Completed
Location of units planned	☐
Suitable work benches provided	☐
Fume extraction system installed and commissioned	☐
Electrical socket outlets available for the Instrument and all accessories	☐
Gas supplies available and tested	☐
Filters for gas supply available and tested (optional)	☐
PC and printer present and according specifications	☐
Customer trainees available	☐

Table 3.1 Summary Pre-Installation Checklist

Section completed: ☐

5 Installation of PC, Windows 7 and NSX Visual Software

Before the NSX Visual Software for the iPRO 5000 can be installed, Windows 7 must be installed on the PC and several settings must be set.

Please follow the correct order of installation and follow the Installation Procedure when performing the actions:

1. Install Windows 7
2. Change settings in Windows 7
3. Install NSX Visual Software

Before starting the installation, make sure the PC requirements mentioned in the Pre-Installation Manual are met. Failure to do so can result in extended installation and possibly and incorrect functioning of the iPRO 5000 Series TN/TS Analyzer.

If the iPRO 5000 Series TN/TS Analyzer has been ordered with a PC, a suitable PC will be delivered. However, the installation of Windows 7 on this PC will not be complete. The testing of the iPRO 5000 Series TN/TS Analyzer will have taken place on a different PC in the factory.

Section completed: ☐

5.1 Installation of the PC

Check if the PC meets the PC requirements as mentioned in the **Pre-Installation Manual**. Do not proceed installing if the PC is found to be not suitable.

Section completed: ☐

5.1.1 Unpacking and connecting the PC and its accessories

Unpack the PC and connect the monitor, keyboard and mouse.

Place the PC on a suitable work bench next to the place where the iPRO 5000 Series TN/TS Analyzer will be situated. Make sure enough space is reserved for the keyboard and mouse. Connect the PC and its accessories and plug it into suitable wall mounts.

Section completed: ☐

5.1.2 Finishing the installation of Windows 7

It is recommended that a Thermo Fisher Scientific trained service engineer finishes the installation of Windows 7.

The responsibility of registering the Windows 7 version is with the customer.

When required, involve the IT department of the customer. A possible requirement might be connecting the PC to a local network.

If, at a later stage users are added to the PC, make sure they all have at least local adminstrator rights. Otherwise the instrument and the PC might not communicate properly.

Power on the monitor and the PC.

Follow the on-screen instructions and fill in the requested regional settings information and press **NEXT**.

On the User Settings screen fill in the requested information. An example is shown below.

Requested information	Fill in	Example (suggestion)
User name	Your name	Thermo
Computer name	A PC name	iPRO-<service tag>*

* To make the name of the PC unique, you can include the service tag found on the top of the PC.

Table 4.1 Example of user settings

Create a memorable password in the password settings screen.
Suggestion to Service Engineer: Admin, use same for hint but only if security is not an issue.

Read the license agreements shown in the next screen and agree by ticking both boxes.
Click **NEXT** to proceed.

The next screen shows you the options to protect the PC. Select the option that suits you. If you are not connected to the corporate network (SMS server) or the internet, automatic update is not available. The recommended setting is indicated in the figure below.

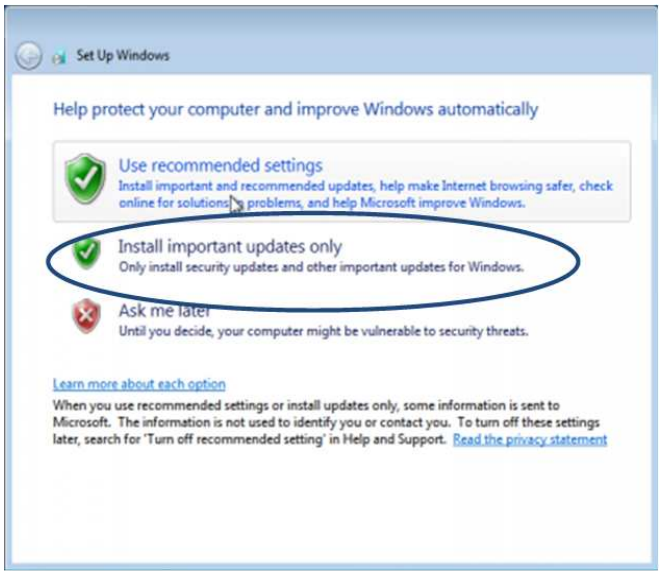

Set Up Windows
Help protect your computer and improve Windows automatically
Use recommended settings
Install important and recommended updates, help make Internet browsing safer, check online for solutions to problems, and help Microsoft improve Windows.
Install important updates only
Only install security updates and other important updates for Windows.
Ask me later
Until you decide, your computer might be vulnerable to security threats.
Learn more about each option
When you use recommended settings or install updates only, some information is sent to Microsoft. The information is not used to identify you or contact you. To turn off these settings later, search for 'Turn off recommended setting' in Help and Support. Read the privacy statement

Fig 4.1 Recommended settings updates

Select the date and time setting appropriate in the next screen.

Make sure the correct time zone is chosen at this point, changing it when the NSX Visual Software is running can result in loss of data.

The next screen provides the opportunity the select a corporate network, when required select **Work Network**. When not required select **Public network**.

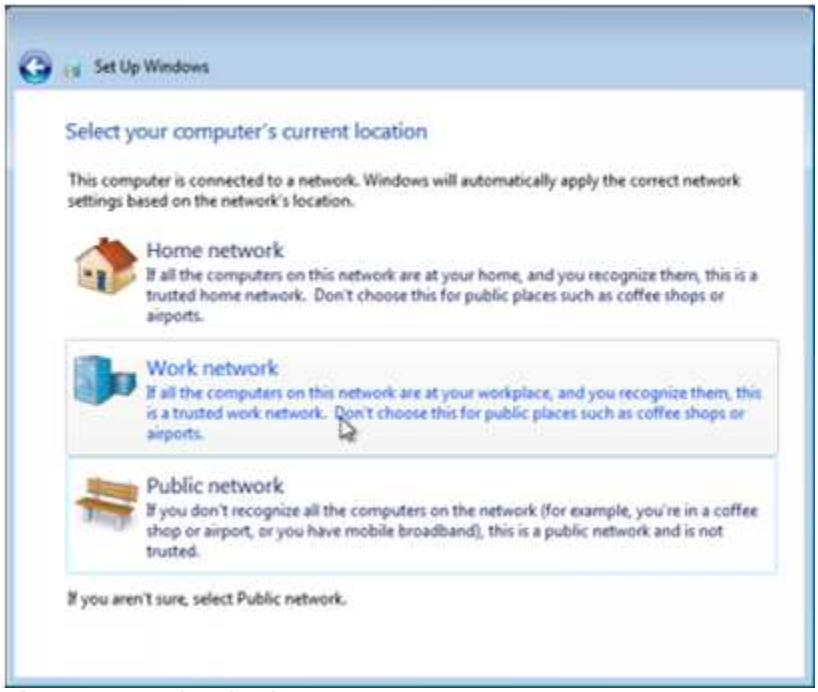

Set Up Windows
Select your computer's current location
This computer is connected to a network. Windows will automatically apply the correct network settings based on the network's location.
Home network
If all the computers on this network are at your home, and you recognize them, this is a trusted home network. Don't choose this for public places such as coffee shops or airports.
Work network
If all the computers on this network are at your workplace, and you recognize them, this is a trusted work network. Don't choose this for public places such as coffee shops or airports.
Public network
If you don't recognize all the computers on the network (for example, you're in a coffee shop or airport, or you have mobile broadband), this is a public network and is not trusted.
If you aren't sure, select Public network.

Fig 4.2 Network selection

Windows will start and when the startup is complete the Dell Client System Update will be shown. Recommended displayed in the figure below.

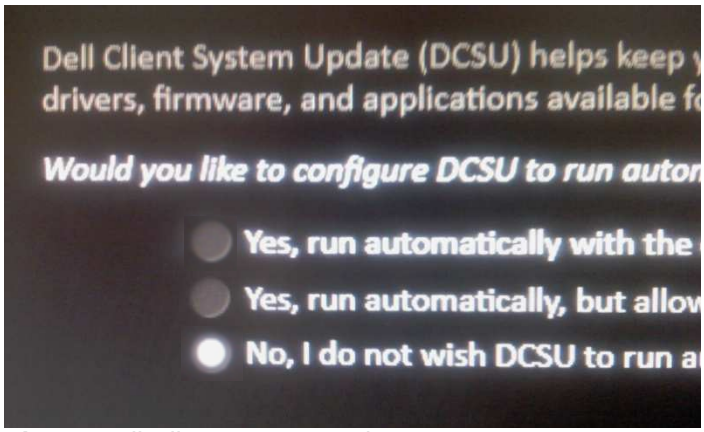

Dell Client System Update (DCSU) helps keep
drivers, firmware, and applications available f
Would you like to configure DCSU to run autor
Yes, run automatically with the
Yes, run automatically, but allow
No, I do not wish DCSU to run a

Fig 4.3 Dell Client System Update

After clicking OK the Windows will check and install any advised updates, internet access is required for this option.

Following Windows will ask you to choose a web browser; internet access is required for this option.

Section completed: ☐

5.2 Configuring Windows 7 for use with the iPRO 5000 Series TN/TS Analyzer

Windows 7 needs certain settings to operate without problems.

Peform all actions described in this chapter, failing to do so can influence the performance of the iPRO 5000 Series TN/TS Analyzer.

5.2.1 Setup Power Options

Open the Control Panel (from the **Start** menu in Windows).

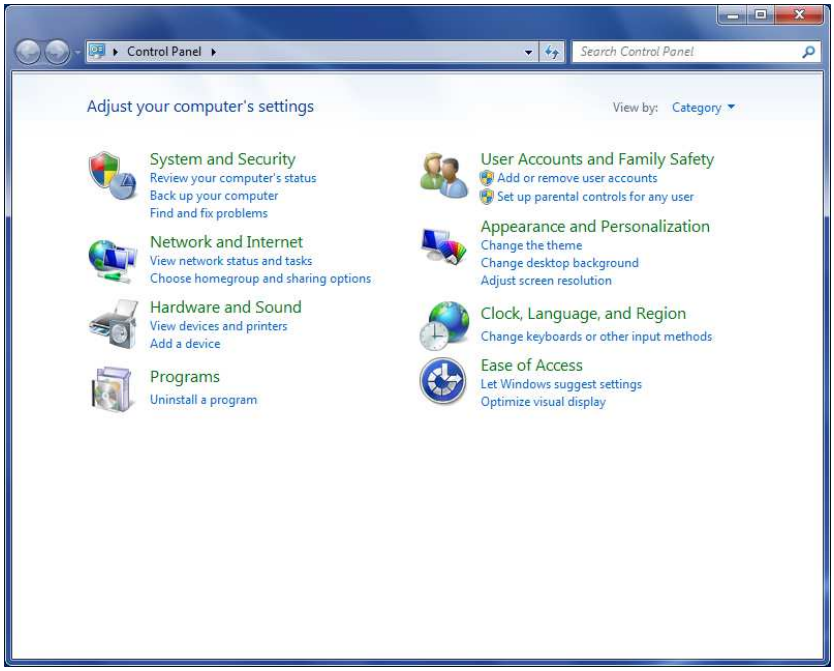


Fig 4.4 Control Panel

Select **Hardware and Sound.**

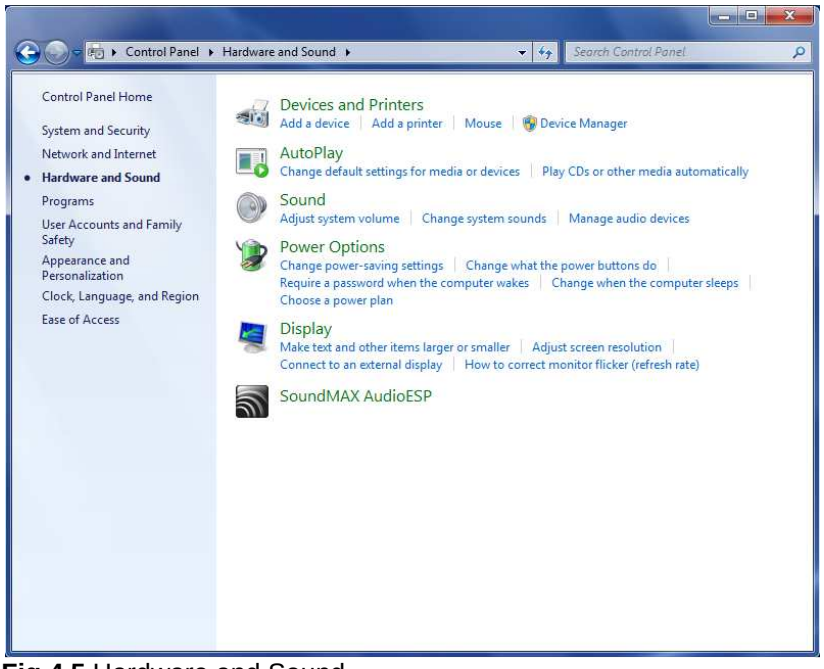


Fig 4.5 Hardware and Sound

Select **Power Options** – **Change when the computer sleeps**.

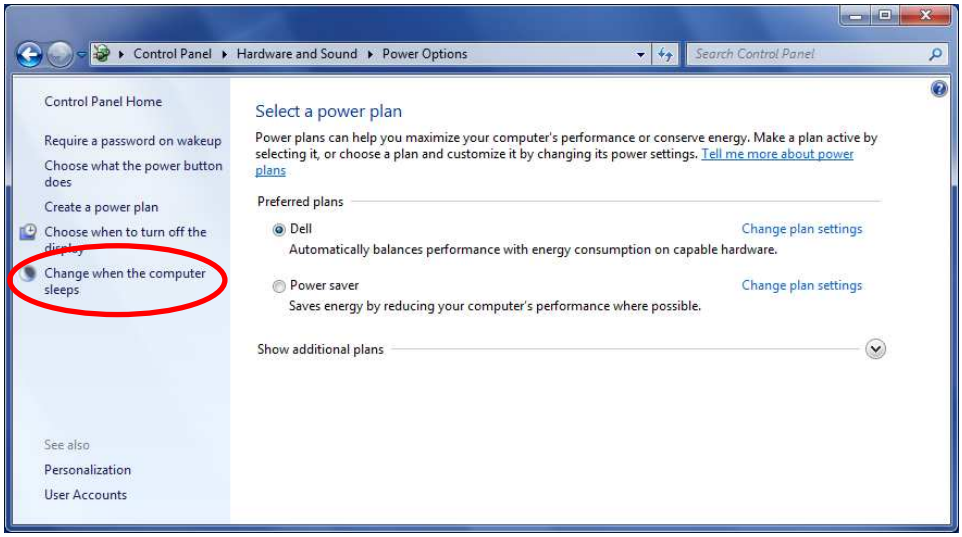

Control Panel ▸ Hardware and Sound ▸ Power Options
Search Control Panel
Control Panel Home
Require a password on wakeup
Choose what the power button does
Create a power plan
Choose when to turn off the display
Change when the computer sleeps
Select a power plan
Power plans can help you maximize your computer's performance or conserve energy. Make a plan active by selecting it, or choose a plan and customize it by changing its power settings. Tell me more about power plans
Preferred plans
Dell
Change plan settings
Automatically balances performance with energy consumption on capable hardware.
Power saver
Change plan settings
Saves energy by reducing your computer's performance where possible.
Show additional plans
See also
Personalization
User Accounts

Fig 4.6 Power Options

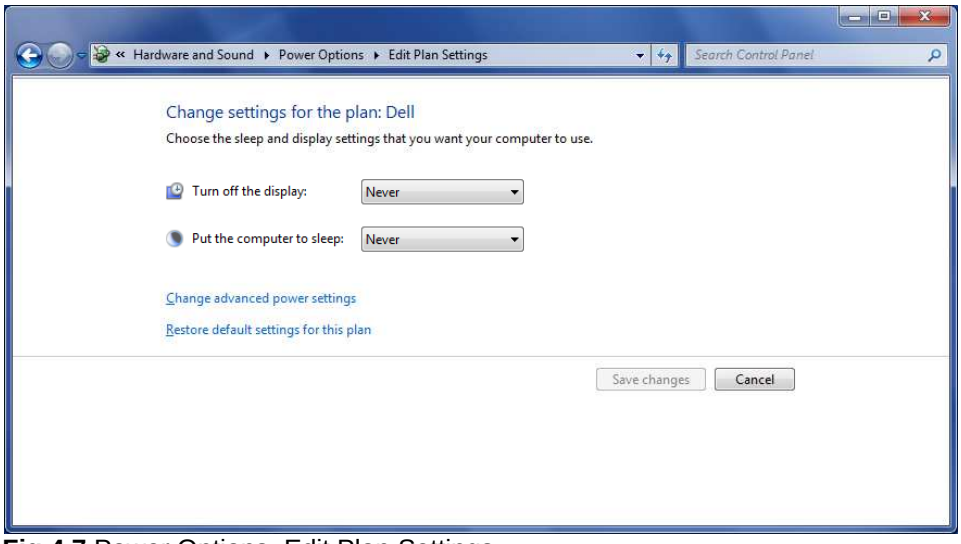

« Hardware and Sound ▸ Power Options ▸ Edit Plan Settings
Search Control Panel
Change settings for the plan: Dell
Choose the sleep and display settings that you want your computer to use.
Turn off the display:
Never
Put the computer to sleep:
Never
Change advanced power settings
Restore default settings for this plan
Save changes
Cancel

Fig 4.7 Power Options, Edit Plan Settings

Set both settings to **Never** and **Save changes**.

Section completed: ☐

5.2.2 Setup Network Adapters

Open the **Control Panel**.

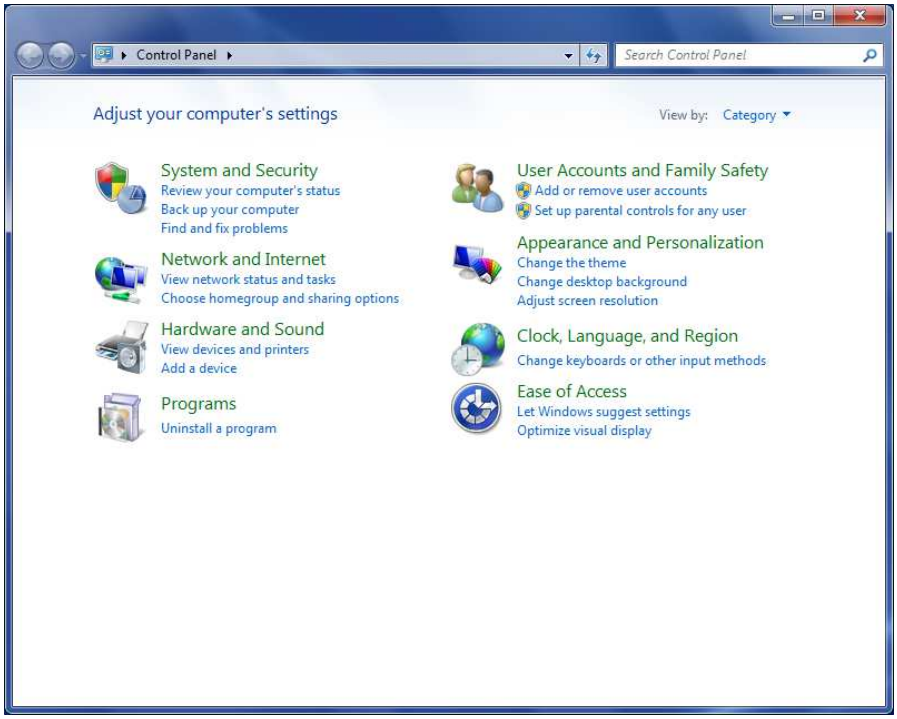


Fig 4.8 Control Panel

Select **View network status and tasks** located in the **Network and Internet** category.

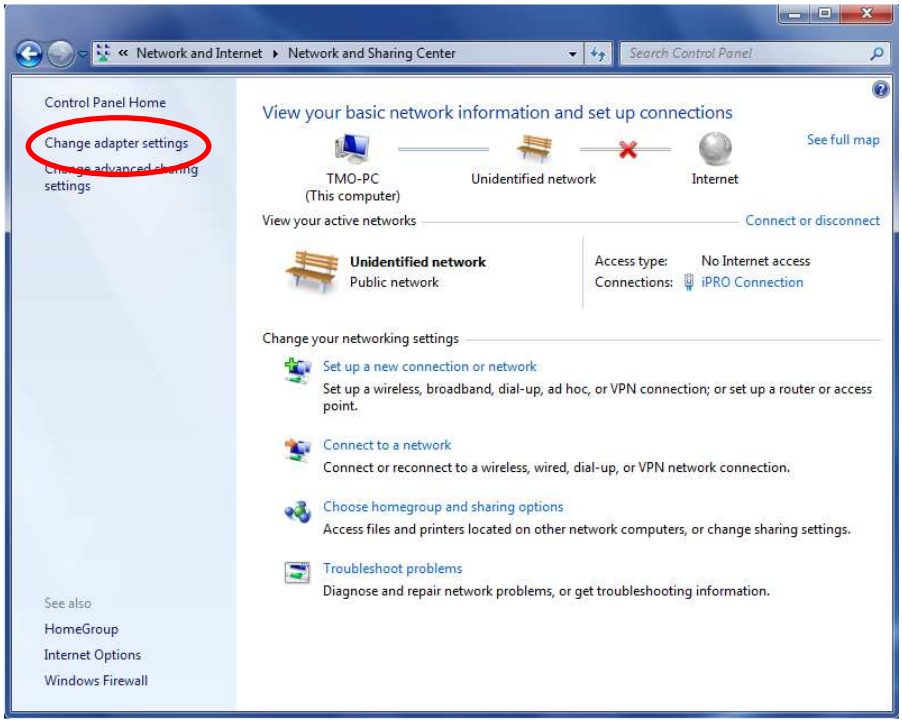

Network and Internet
Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
settings
View your basic network information and set up connections
See full map
TMO-PC
(This computer)
Unidentified network
Internet
View your active networks
Connect or disconnect
Unidentified network
Public network
Access type: No Internet access
Connections: iPRO Connection
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.
Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.
See also
HomeGroup
Internet Options
Windows Firewall

Fig 4.9 Network and Internet

Choose **Change Adaptor settings** on the left side.

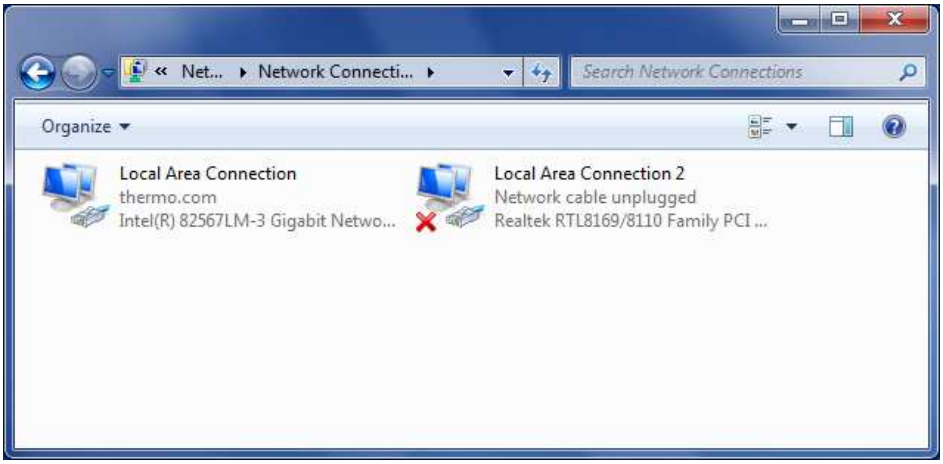


Fig 4.10 Change Adaptor Settings

If you have 2 adapters (like in the above example) you need to assign one (choose one) to be connected to the instrument. In this case 'Local Area Connection 2' is chosen to be the connection to be connected to the instrument.

The table below shows the standard configuration as delivered by Thermo Fisher Scientific Cambridge (UK):

	Manufacturer	**Physical Location**
Adapter 1	Intel	On the rear of PC, half way down on the right
Adapter 2	Realtek	On the rear of PC, at the bottom (added)

Table 4.2 Standard Configuration as delivered by Thermo Fisher Scientific

Identifying which adapter is which (physically) can be done by plugging in a connected cable to only one of the adapters; the other adapter should mention **Network cable unplugged**.

Select the adapter chosen to be connected to the iPRO 5000 Series TN/TS Analyzer and rename it (by selecting the connection and press F2) to **iPRO Connection**. This will make it easy to identify the connection later on.
Optionally you can specify a different name for the adapter for the connection to the corporate network.

Fig 4.11 Re-named connections

A User Account Control page (example in section **Installation of NSX Visual Software**) should not come up. When it does, contact your local IT department and check the administrator rights. The PC is likely to be not new or the installation has not been finished just a minute ago and the administrator rights have been changed.

Right click on the **iPRO Connection** adapter and choose **properties**.

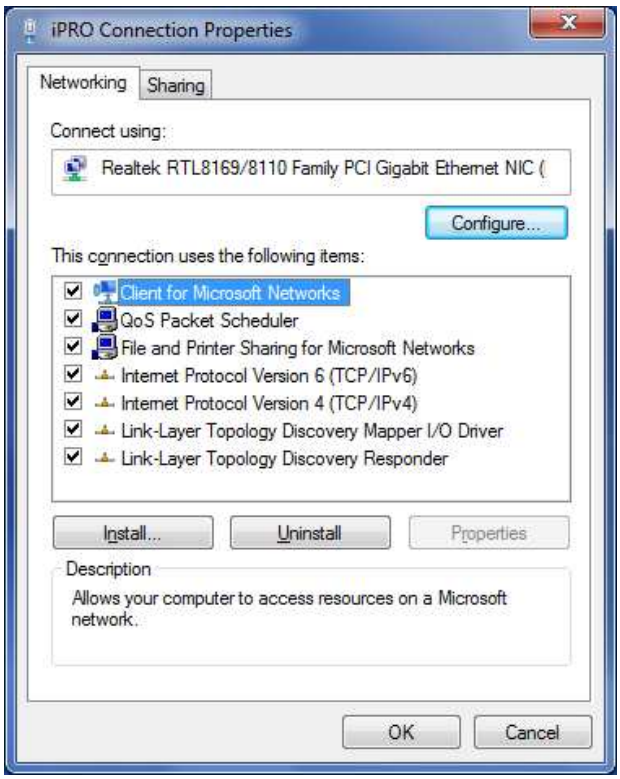


Fig 4.12 iPRO Connection Properties

Un-tick all options, only select the **Internet Protocol Version 4 (TCP/IPv4),** press properties.

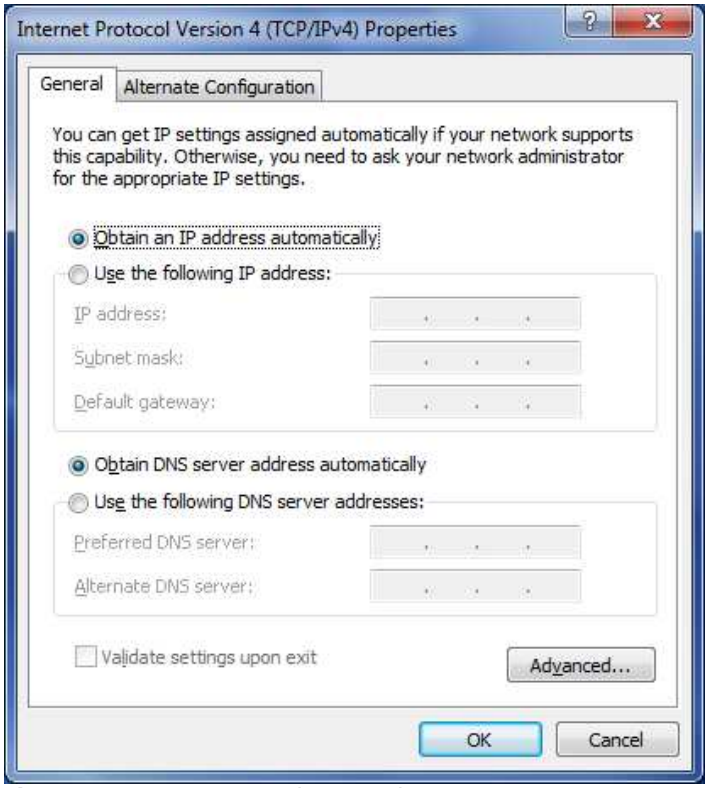

Internet Protocol Version 4 (TCP/IPv4) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

Fig 4.13 Internet Protocol Properties

Select **Use the following IP address** and add the **IP address** and **Subnet mask** as shown below.

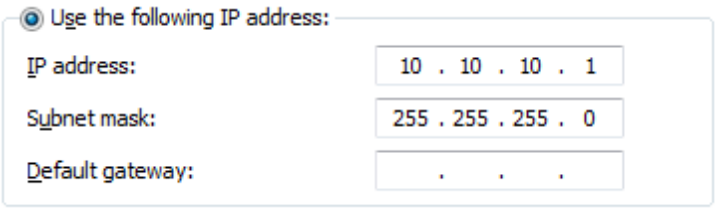


Fig 4.14 IP-address and Subnet Mask

Press **OK** and **Close** in the next screen. Close the Network connections screen.

Section completed:

5.2.3 Setup the Firewall Exclusions

This procedure assumes the use of the Windows firewall. When using another type/brand of firewall, exclude the **'iPRO Connection'** adaptor in the firewall by following similar steps as described below.

Open the **Control Panel** and select **System and Security** – **Windows Firewall**.

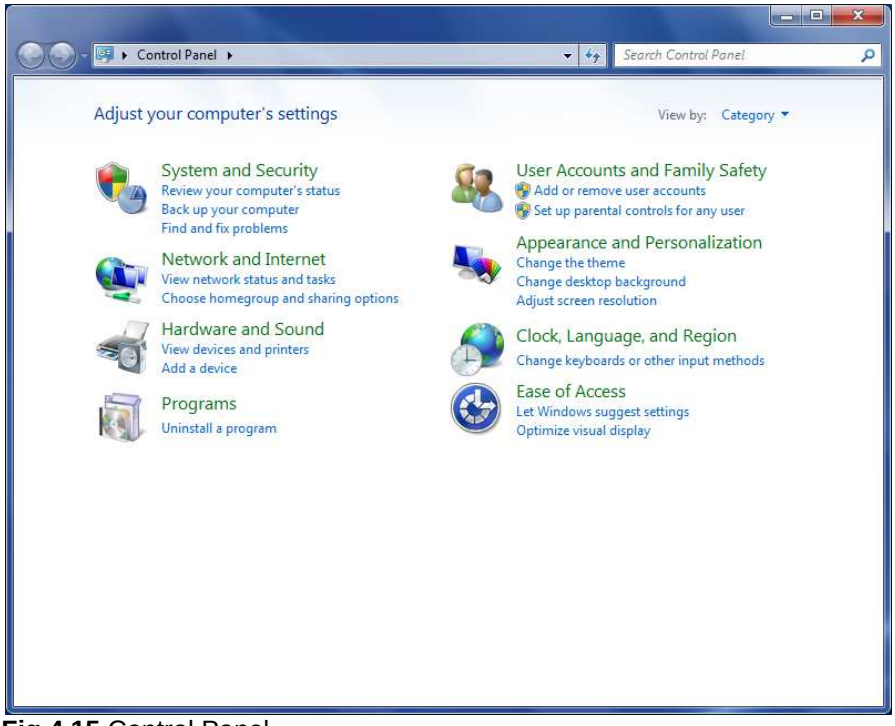


Fig 4.15 Control Panel

Click on **Advanced settings**.

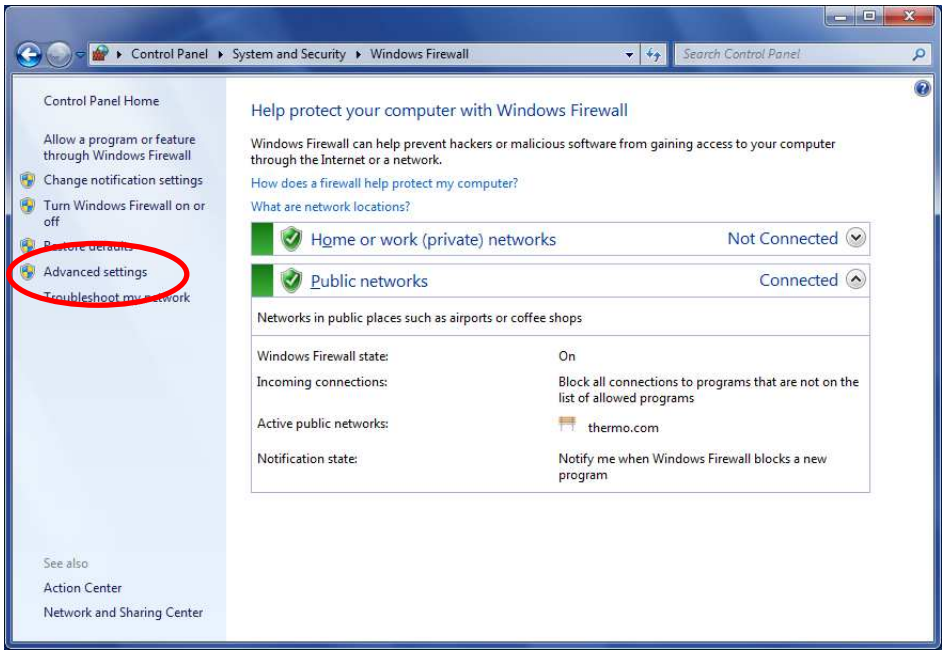

Control Panel ▸ System and Security ▸ Windows Firewall
Search Control Panel
Control Panel Home
Allow a program or feature through Windows Firewall
Change notification settings
Turn Windows Firewall on or off
Advanced settings
Help protect your computer with Windows Firewall
Windows Firewall can help prevent hackers or malicious software from gaining access to your computer through the Internet or a network.
How does a firewall help protect my computer?
What are network locations?
Home or work (private) networks
Not Connected
Public networks
Connected
Networks in public places such as airports or coffee shops
Windows Firewall state:
On
Incoming connections:
Block all connections to programs that are not on the list of allowed programs
Active public networks:
thermo.com
Notification state:
Notify me when Windows Firewall blocks a new program
See also
Action Center
Network and Sharing Center

Fig 4.16 Windows Firewall

Click on **Properties** in the Actions box.

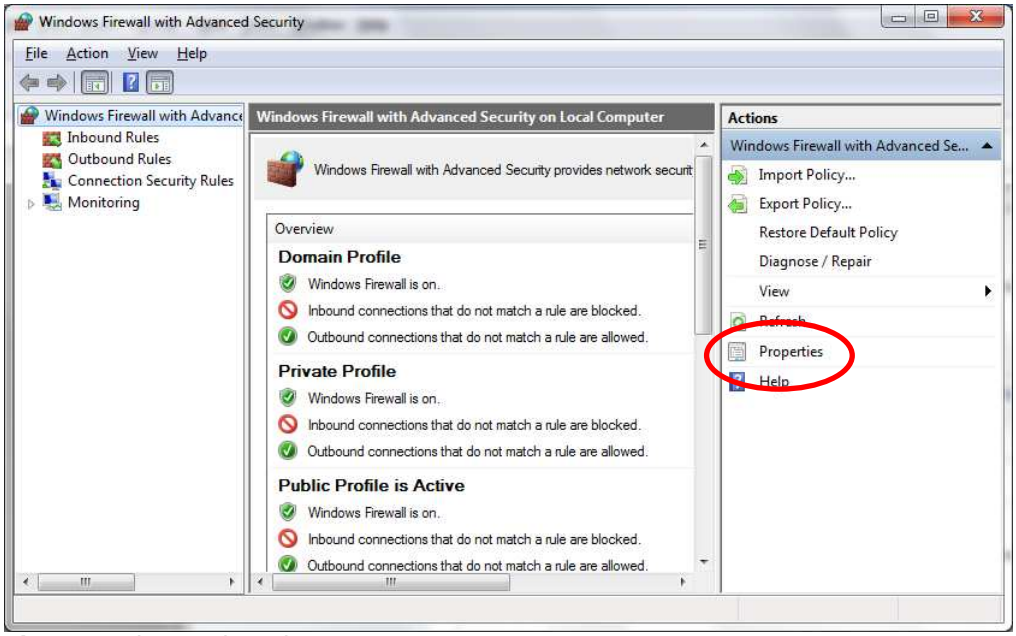

Windows Firewall with Advanced Security
File Action View Help
Windows Firewall with Advanc
Inbound Rules
Outbound Rules
Connection Security Rules
Monitoring
Windows Firewall with Advanced Security on Local Computer
Windows Firewall with Advanced Security provides network securit
Overview
Domain Profile
Windows Firewall is on.
Inbound connections that do not match a rule are blocked.
Outbound connections that do not match a rule are allowed.
Private Profile
Windows Firewall is on.
Inbound connections that do not match a rule are blocked.
Outbound connections that do not match a rule are allowed.
Public Profile is Active
Windows Firewall is on.
Inbound connections that do not match a rule are blocked.
Outbound connections that do not match a rule are allowed.
Actions
Windows Firewall with Advanced Se...
Import Policy...
Export Policy...
Restore Default Policy
Diagnose / Repair
View
Properties
Help

Fig 4.17 Advanced Settings

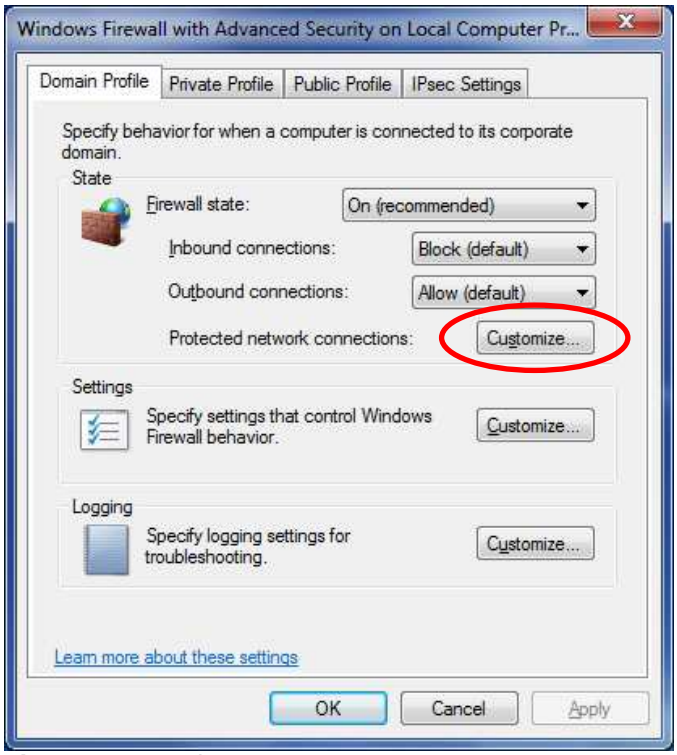


Fig 4.18 Properties

For Domain Profile, Private Profile and Public Profile repeat the next steps.
On each of the three tabs click on the **Customize...**-button next to **Protected network connections**.

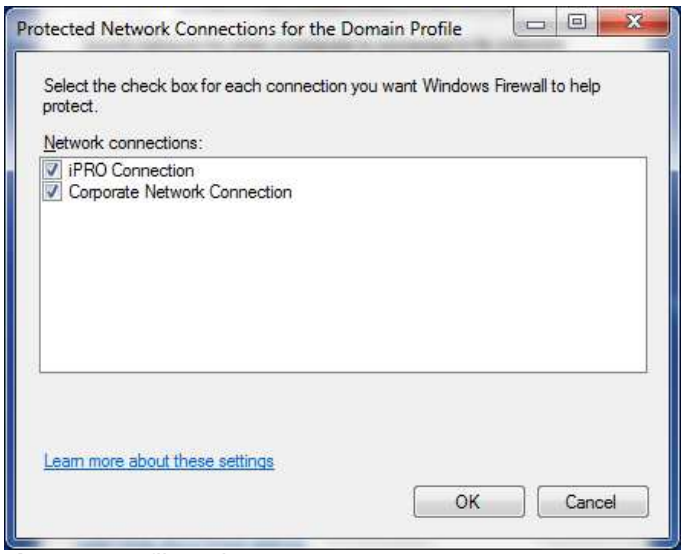

Protected Network Connections for the Domain Profile
Select the check box for each connection you want Windows Firewall to help protect.
Network connections:
iPRO Connection
Corporate Network Connection
Learn more about these settings
OK
Cancel

Fig 4.19 Profile Tab

Uncheck the **iPRO Connection** and press **OK**.

Continue with the next profile, until all three are completed.

Close the screen by pressing the **OK** button.

Close all other screens and restart the PC.

Section completed: ☐

5.3 Installation of NSX Visual Software

Do not install NSX Visual Software when the previous pages of this Installation Procedure have not been followed or the installation of Windows 7 and the setting it up for NSX Visual Software has not been as expected.

Open the folder containing NSX Visual Software on the DVD disc with the iPRO 5000 Series TN/TS Analyzer.

Run the file **Setup.exe**. This will start the installation of NSX Visual Software.

A pop up will appear of the User Account Control – click **Yes**.

User Account Control
Do you want to allow the following program from an unknown publisher to make changes to this computer?
Program name: Setup.exe
Publisher: Unknown
File origin: Removable media on this computer
Show details
Yes
No
Change when these notifications appear

Fig 4.20 User Account Control

Click on **Change when these notifications appear** and lower the security to the lowest possible level.

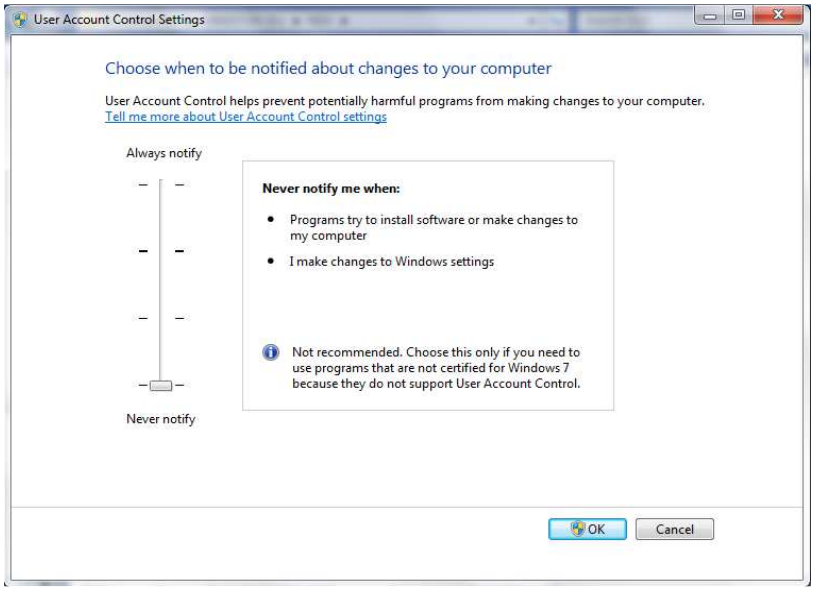

User Account Control Settings
Choose when to be notified about changes to your computer
User Account Control helps prevent potentially harmful programs from making changes to your computer.
Tell me more about User Account Control settings
Always notify
Never notify me when:
Programs try to install software or make changes to my computer
I make changes to Windows settings
Not recommended. Choose this only if you need to use programs that are not certified for Windows 7 because they do not support User Account Control.
Never notify
OK
Cancel

Fig 4.21 Change Settings User Account Control

Click on **OK**, the User Account Control will ask you for a conformation.

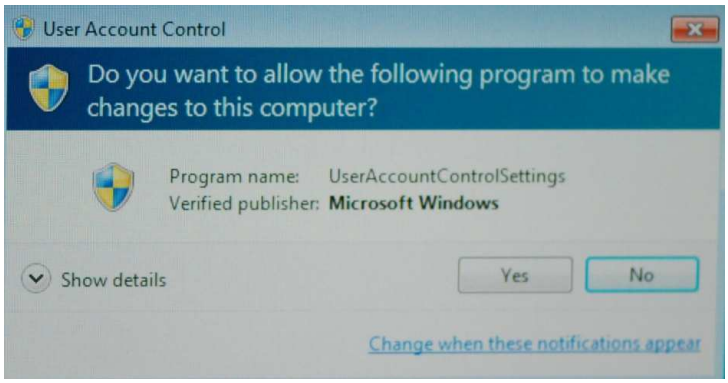

User Account Control
Do you want to allow the following program to make changes to this computer?
Program name: UserAccountControlSettings
Verified publisher: Microsoft Windows
Show details
Yes
No
Change when these notifications appear

Fig 4.22 Conformation User Account Control

Click **Yes**, NSX Visual Software can now be installed.

Run **Setup.exe** again.

Since this PC will be connected to the iPRO 5000 Series TN/TS Analyzer, choose **Local**.

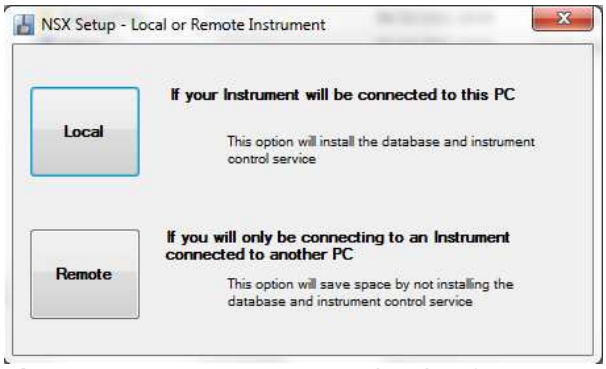

NSX Setup - Local or Remote Instrument
Local
If your Instrument will be connected to this PC
This option will install the database and instrument control service
Remote
If you will only be connecting to an Instrument connected to another PC
This option will save space by not installing the database and instrument control service

Fig 4.23 Startup Screen NSX Visual Software Installer

The installation of NSX Visual Software will now start with the extraction of the necessary files. At some moment a DOS-prompt will appear, please do not close the screen.

Do not cancel the installation or close any windows, please be patient. Even when the installation seems to not proceed, please be patient. In some cases – depending on the speed of the PC, type and numbers of programs installed – it can take up to 5 minutes.

After selecting **Local** the installation will start. First screen on the installation of the SQL Server will appear. Wait until the following screens appear and follow the recommended folder choice by pressing **Next**.

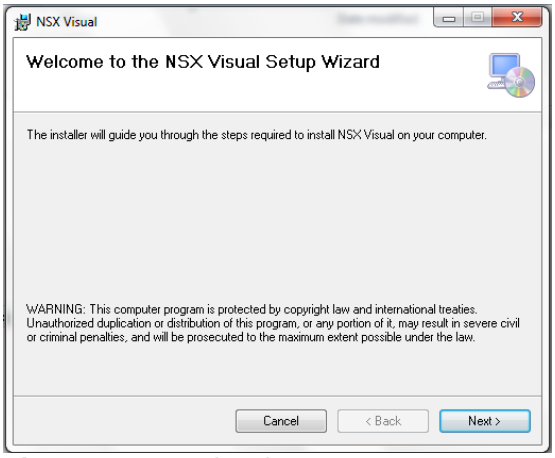

NSX Visual
Welcome to the NSX Visual Setup Wizard
The installer will guide you through the steps required to install NSX Visual on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

Fig 4.24 Setup Wizard -1-

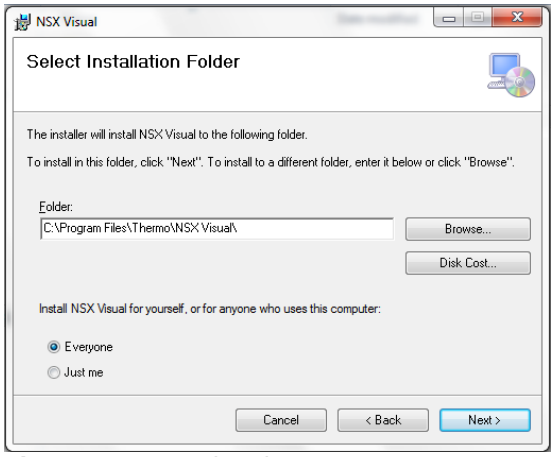

NSX Visual
Select Installation Folder
The installer will install NSX Visual to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files\Thermo\NSX Visual\
Browse...
Disk Cost...
Install NSX Visual for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >

Fig 4.25 Setup Wizard -2-

Select **Everyone**, click **Next** and follow the on-screen instructions.

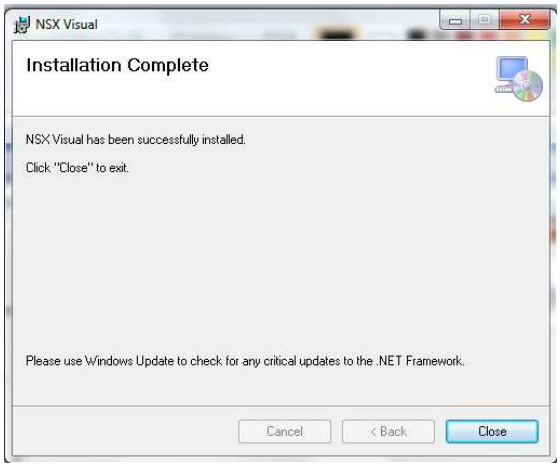

NSX Visual
Installation Complete
NSX Visual has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

Fig 4.26 Setup Wizard -3-

When the installation is completed, click on **Close**.

The installation of NSX Visual Software is now finished. The program (NSX Visual) will be started later during the installation procedure.

Section completed: ☐

6 Installation of the iPRO 5000 Series TN/TS Analyzer

The installation must be carried out by a factory approved service engineer. It is very important that these procedures are followed, in correct order and taking account of the timing required. Failure to do so can result in extended installation and possible damage to teh instrument. The procedures and timings are designed to prevent problems with the NSX Visual Software, firmware and hardware.

The iPRO 5000 Series TN/TS Analyzer should not be powered at this point.

6.1 Placing the Instrument

Unpack the iPRO 5000 Series TN/TS Analyzer and inspect for damage. Place the instrument on the designated table and make sure all the recommendations for space, ventilation and power are followed. Do not connect the instrument to the power at this moment.

Section completed: ☐

6.2 jetPRO direct spray injector, Protection Tube and Furnace Tube

Remove the jetPRO direct spray injector and visually inspect it. Remove the Protection Tube form the Folded Combustion Tube. If damaged, it will need replacing. Any contamination has to be removed. Check the condition of the O-rings of both the jetPRO direct spray injector and the Protection Tube.

Section completed: ☐

6.3 Perma Pure Compartment

Visually inspect the Perma Pure and the Inline Filter for contamination. The Perma Pure should contain no sharp bends. The inline filter should have none or very little contamination. Check if the Furnace Exhaust including the Soot Sensor Nut is tightened well. Also check if the connections of the Perma Pure are tightened well.

Section completed: ☐

6.4 Bottle Compartment

Place the tubing for the waste in the bottle for the waste (left bottle) and the tubing for the solvent in the bottle for the solvent (right bottle). Make sure the correct bottles are used and pay attention to the size of the tubing and its corresponding hole in the cap of the bottle. Make sure the tubing of both bottles is correctly placed. For the waste bottle the tubing should end just under the surface of the cap. For the wash bottle the tubing should end at the bottom of the bottle. Place both bottles on the corresponding scales. Connect the connections to the syringe pump.

To avoid contamination by sample in the syringe pump do not shorten the tubing from the pump to the AS3000 II Autosampler.

Make sure the end of the tubing to the waste bottle is situated correctly: right under the surface of the cap. Also make sure the end of the tubing to the wash bottle is situated correctly at the bottom of the bottle.

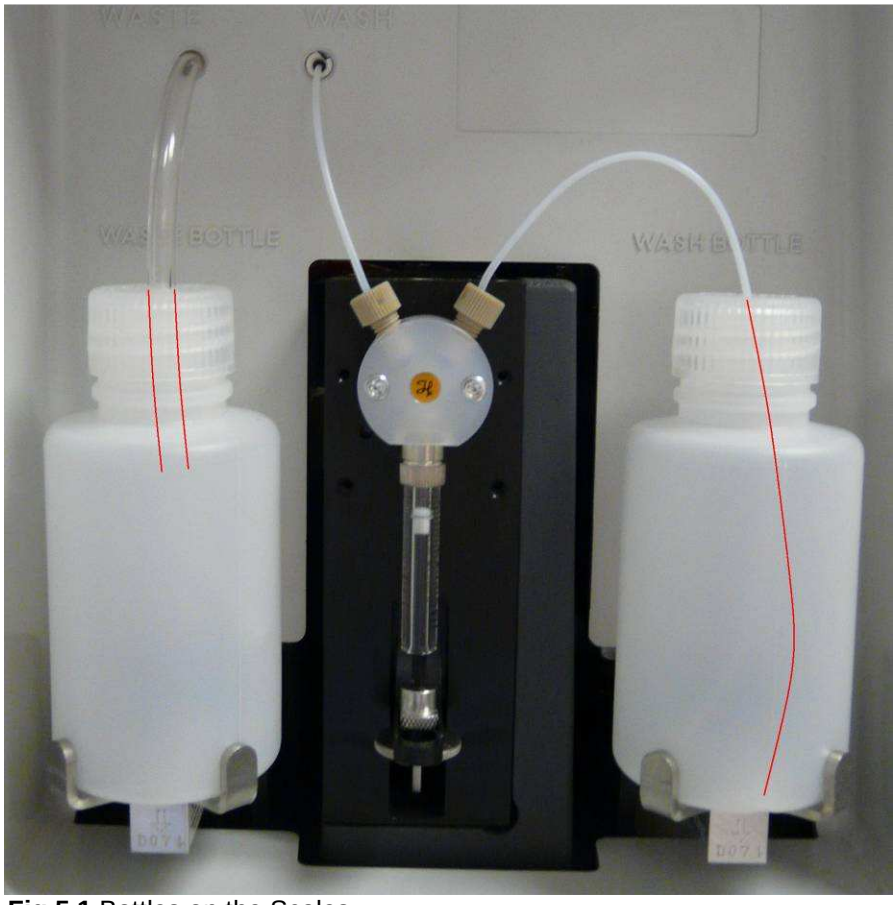


Fig 5.1 Bottles on the Scales

Section completed: ☐

6.5 AI/AS3000 II Autosampler

Check which sampler tray is used and take the appropriate positioning tray. The delivery of the tray depends on the order placed. There are two possibilities; both are shown in the pictures below, the 105-position tray (top) and the 8-position tray (bottom).

Fig 5.2 Positioning tray with and without the corresponding sample tray

Section completed: ☐

6.5.1 Thermal Switches

The Thermal Switches may be activated due to transportation. Press the thermal switches located at the left side of the centring plate in fully for 2-3 seconds.

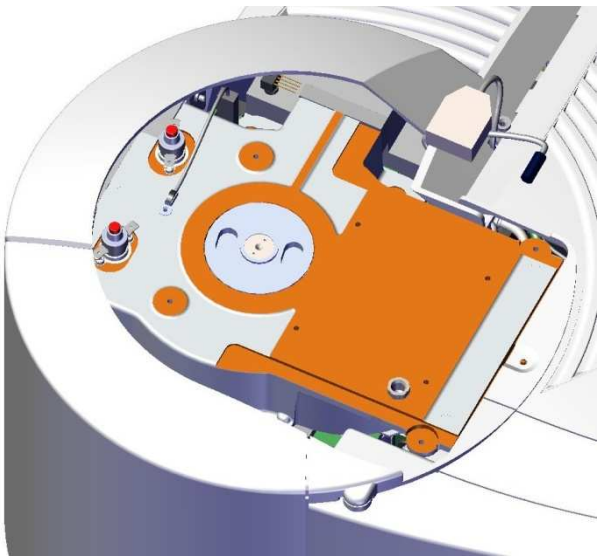


Fig 5.3 Thermal Switches overview

Section completed: ☐

6.5.2 Placing the positioning tray

Use four screws to mount the correct positioning tray on top of the iPRO 5000 Series TN/TS Analyzer.

Section completed: ☐

6.5.3 Placing the AS3000 II Autosampler

Place the AS3000 II Autosampler on top of the iPRO 5000 Series TN/TS Analyzer and do not bolt it down. Do not place the tray at this moment. Check that the injector cooling flange (top part of the jetPRO direct spray injector) is level with the furnace cooling head.

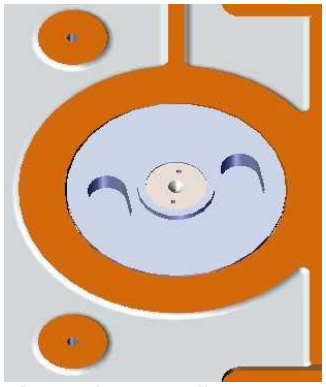


Fig 5.4 jetPRO direct spray injector flush with the surface of the Cooling Head

Right: Connect the centring plate to the AS3000 II Autosampler and make sure that the centring plate sits perfectly on the injection port. The AS3000 II Autosampler will then automatically end up in the correct position.

Fig 5.5 Placing the AS3000 II Autosampler on top.

Install M4 screws with washers on the right side of the AS3000 II Autosampler using a ball-end Allen key. Do not use a straight Allen key since it may damage the thread. Tighten the screws fully. Remove the centring plate and install M4 screws with washers on the left side of the AS3000 II Autosampler. Check if all 4 screws are fully tightened.

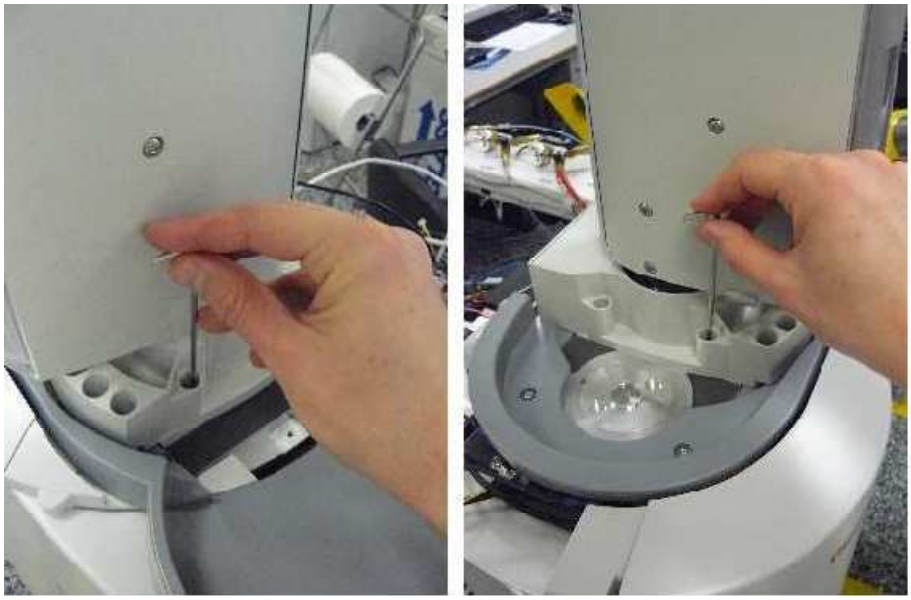


Fig 5.6 Tightening the screws

Section completed: ☐

6.5.4 Place the centring plate.

Check that the waste adaptor is equipped with an o-ring. Install the waste adaptor. Make sure that it is pushed home and that its surface is level with the AS3000 II Autosampler base casting.

Fig 5.7 Positioning Waste Collector

Make sure the waste collector is fully seated.

Install the 105- or 8-position tray. Make sure that it is level with the sampler base casting.

Fig 5.8 Placing the tray

Section completed:

6.5.5 Placing the needle

Open the transparent door of the AS3000 II Autosampler to reach the sampler needle. Make sure the needle holder is well positioned: the top should be placed flush with the housing (see red circle in the pictures below) and the black lock (displayed lower, under the red circle) should be in position.

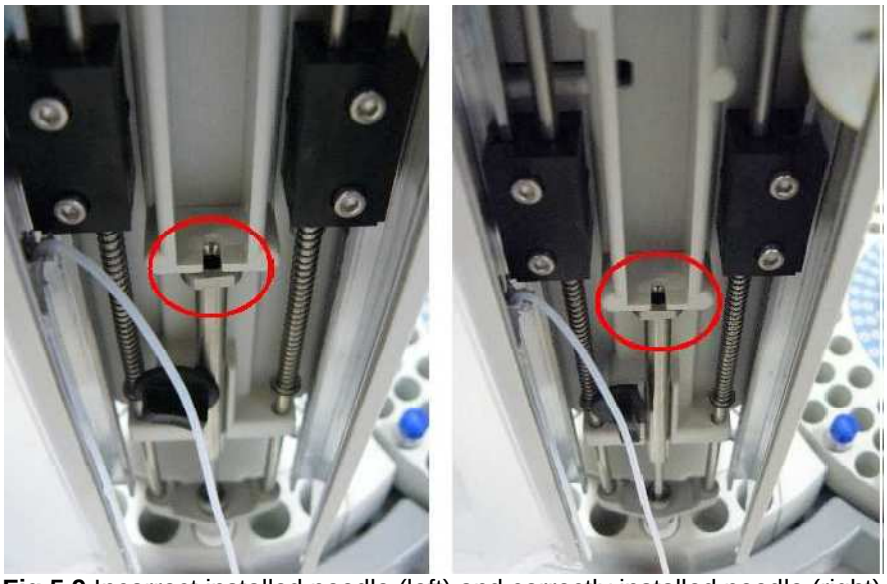


Fig 5.9 Incorrect installed needle (left) and correctly installed needle (right)

Place the AS3000 II Autosampler needle in the needle holder. Lift the needle holder in order to guide the tip of the needle through the hole in the needle holder.

Connect the tubing from the top of the Instrument to the Autosampler needle. Place the needle holder into the needle support of the AS3000 II Autosampler. When the transparent door is closed make sure the tubing is not obstructing the movement of the AS3000 II Autosampler. Check if the tubing is fed through the guides and well fed on the coil on the backside of the AI/AS 3000 II Autosampler. Make sure enough tubing is not on the coil for the AS3000 II Autosampler (and its needle) to move.

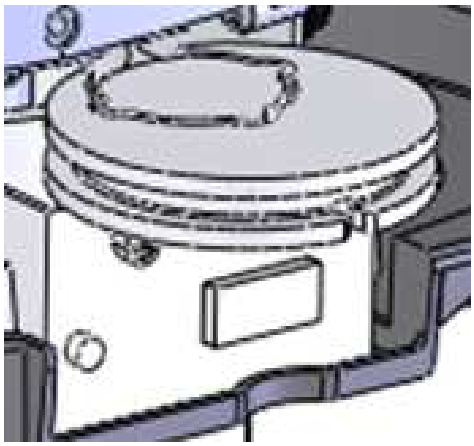


Fig 5.10 Coil for the tubing located on the backside of the AI/AS 3000 II Autosampler

The length of the tubing is important, do not shorten it.

Section completed: ☐

6.5.6 Communication and power connections

Connect the tray cable (when applicable) and RS-232 cable from the top of the instrument. Only when the two connections are made connect the power.

NOTE: The GC-connection on the AI/AS 3000 II Autosampler is not used in combination with the iPRO 5000 Series TN/TS Analyzer.

The power cable should always be connected last and disconnected first.

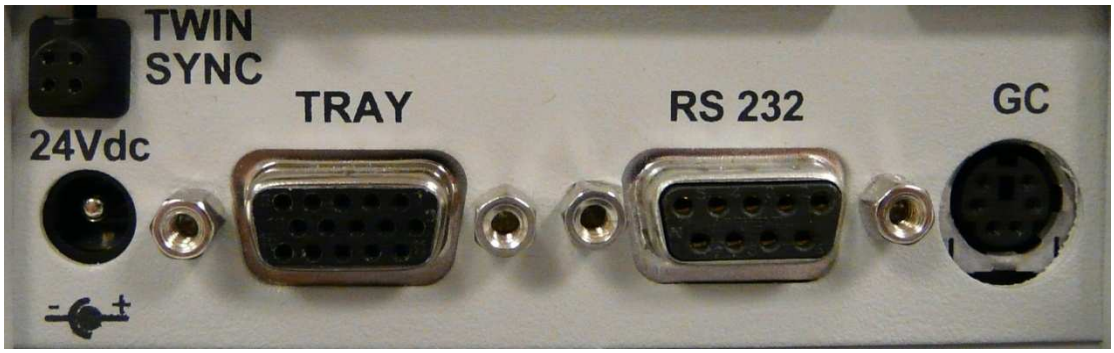


Fig 5.11 Rear of the AI/AS 3000 II Autosampler

Section completed: ☐

6.6 iPRO 5000 Series TN/TS Analyzer Connections

Make sure that the iPRO 5000 Series TN/TS Analyzer is switched off (locate the main switch at the right hand side) before connecting the power cable to a mains wall mount.

Connect the power cable, network cable, vent and the gases to the iPRO 5000 Series TN/TS Analyzer. Connect the network cable from the iPRO 5000 Series TN/TS Analyzer to the PC (to the correct network card).

Use the delivered shielded network cable, do not replace with another cable.

For the vent a four meter PTFE tubing has been provided, shorten if necessary.

The argon and oxygen tubing is provided with **stainless steel** nuts and ferrules. Place the inline filters in the gas supply lines 10-20 cm from the instrument, use the nuts and ferrules of the inline filter. If the argon/helium connection is not used it should be closed off using a blind nut. A blind nut will be supplied with the instrument.

If the laboratory's gas connections are NOT stainless steel then it is important that you provide 1/8 inch nuts and ferrules of the relevant material. FAILURE TO DO SO COULD RESULT IN DANGEROUS GAS LEAKS.

Do not connect oxygen on the argon connection.

Watch the flow direction of the inline filters.

Fig 5.12 Power cable, network cable, vent and gas connections

The accessory EGM-III gas/LPG module has its own power cable. When used, connect the EGM-III gas/LPG module separately to a mains wall socket.

Do not power on the instrument at this moment.

Section completed: ☐

6.7 Set the Pressure for the Gases

Set the gas regulators of the gases used to the desired 5 barg pressure (range is 3-7 barg). Do not turn on the regulators at this moment.

Section completed: ☐

6.8 Powering on the iPRO 5000 Series TN/TS Analyzer

Once all connections for power, communications and gas have been made, power on the iPRO 5000 Series TN/TS Analyzer.

The fans will make noise, especially during the start up of the instrument. During the start up the fans will operate at maximum speed and the regulation will start shortly after the start up.

Section completed: ☐

6.9 Starting NSX Visual Software for the first time

Make sure the iPRO 5000 Series TN/TS Analyzer has been given enough time to boot up before starting the NSX Visual Software – allow at least one minute.

The installation of the NSX Visual Software has added a shortcut on the desktop. By double clicking on the shortcut the NSX Visual Software will start.

The login screen will appear and the login is required. Start the first time as an administrator (username **admin** and password **NSX**) and log on.

Windows 7 will recognize the NSX Visual Software as a new program, therefore access rights need to be appointed. A Windows Security Alert window will appear, tick all boxes (there can be less than 3 boxes) and press **Allow access**.

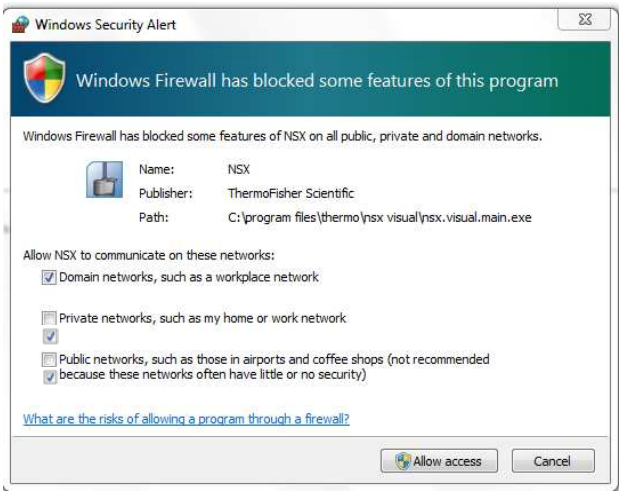

Windows Security Alert
Windows Firewall has blocked some features of this program
Windows Firewall has blocked some features of NSX on all public, private and domain networks.
Name: NSX
Publisher: ThermoFisher Scientific
Path: C:\program files\thermo\nsx visual\nsx.visual.main.exe
Allow NSX to communicate on these networks:
Domain networks, such as a workplace network
Private networks, such as my home or work network
Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)
What are the risks of allowing a program through a firewall?
Allow access
Cancel

Fig 5.13 Windows Security Alert

Section completed: ☐

6.10 Connect the NSX Visual Software to the iPRO 5000 Series TN/TS Analyzer

For detailed software operations, please refer to the latest version of the **NSX Visual Software Manual**.

After logging on, the Main Window of the NSX Visual Software will open.

The status should indicate SHUT DOWN at this moment. If the NSX Visual Software does not make contact (STATUS OFFLINE) with the iPRO 5000 Series TN/TS Analyzer, check the network port settings on the PC and the cable. Restart the PC and try again.

Section completed: ☐

6.11 Selecting the correct type of carrier gas

Select the correct carrier gas (connected earlier during the installation) in the NSX Visual Software. If 'Oxygen' is selected, make sure the blind cap is used to close off the argon connection. If oxygen is chosen, it will be taken from the secondary gas. It does not need a separate oxygen connection. For more information on the NSX Visual Software settings, see the **User Guide**.

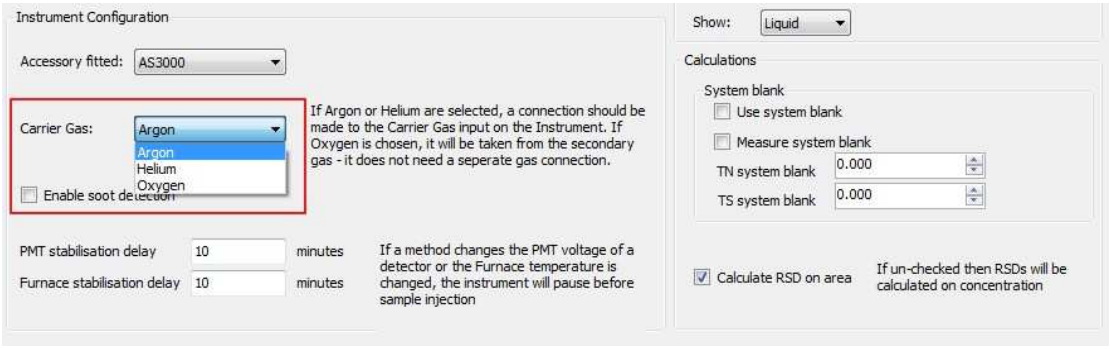

Instrument Configuration
Accessory fitted:
AS3000
Carrier Gas:
Argon
Argon
Helium
Oxygen
Enable soot detection
If Argon or Helium are selected, a connection should be made to the Carrier Gas input on the Instrument. If Oxygen is chosen, it will be taken from the secondary gas - it does not need a seperate gas connection.
PMT stabilisation delay
10
minutes
Furnace stabilisation delay
10
minutes
If a method changes the PMT voltage of a detector or the Furnace temperature is changed, the instrument will pause before sample injection
Show:
Liquid
Calculations
System blank
Use system blank
Measure system blank
TN system blank
0.000
TS system blank
0.000
Calculate RSD on area
If un-checked then RSDs will be calculated on concentration

Fig 5.14 Carrier gas selection

Section completed: ☐

6.12 Preparing the AI/AS3000 II Autosampler

Fill the wash bottle with the desired solution. Thermo Fisher Scientific advises the same solvent that is used for your calibration standards.

*Water and ammonia are not suitable as washing liquid, check the **Pre-Installation Manual** for more information*

Execute the **Rinse Needle** system task in the NSX Visual Software (see the **NSX Visual Software Manual** for more information) until liquid flows into the waste bottle. This typically requires executing the Rinse Needle system task 4 or 5 times.

Section completed: ☐

6.13 Calibrate the AI/AS3000 II Autosampler

Calibrate the AI/AS3000 II Autosampler (see **User Guide** for more information).

Do not continue until the AI/AS3000 II Autosampler is properly calibrated. Incorrect needle depth will cause incorrect results and high RSDs.

Section completed: ☐

6.14 Starting Up the iPRO 5000 Series TN/TS Analyzer

Execute **Start Up** in the NSX Visual Software. The AI/AS3000 II Autosampler will initialize itself and the iPRO 5000 Series TN/TS Analyzer will be set on default settings. The furnace and all other heated zones will start heating to the default operating temperatures. All flows will be set and the detectors will be switched on.

Section completed: ☐

6.15 Perform a Gas System Test

Open the reducers of the gas supplies. Perform a Gas System Test by logging in as **Service** using the password and access codes provided during the iPRO 5000 Service Training.

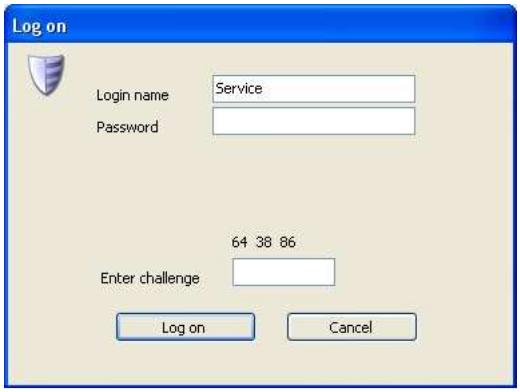


Fig 5.15 Service Login

In the Menu **Service Test** select **Service Tests**.

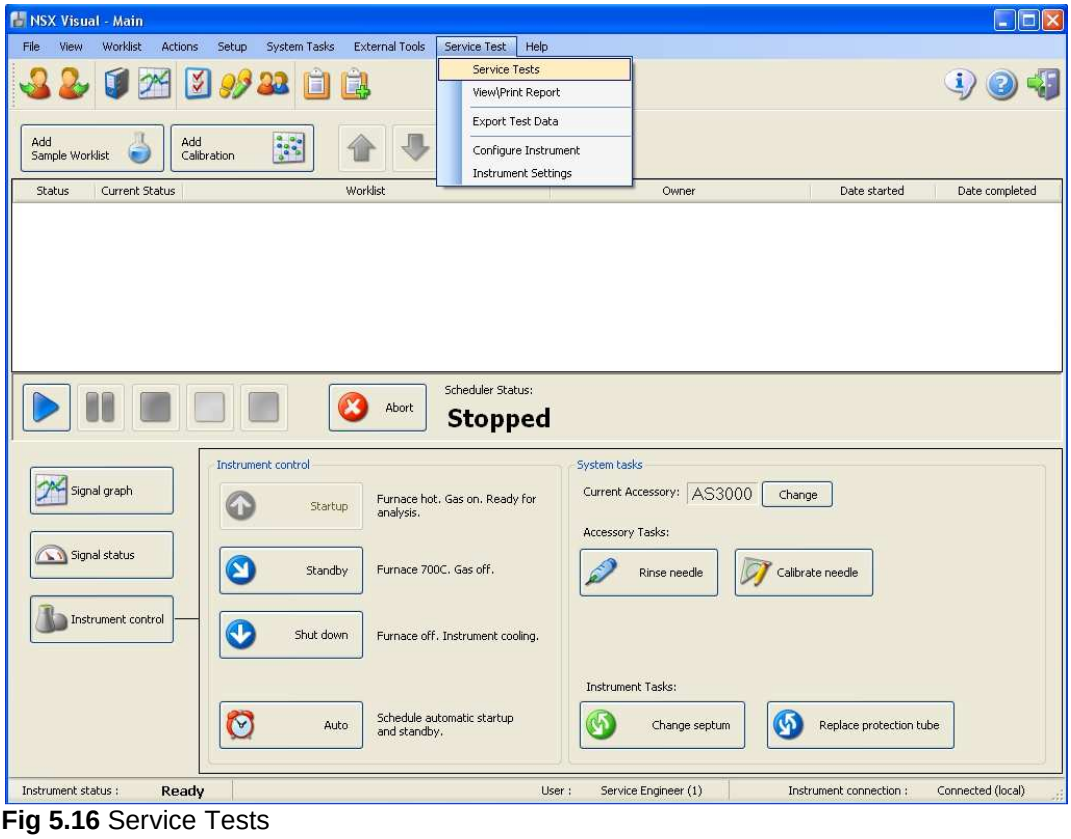


Fig 5.16 Service Tests

In the tab **Calibrate** click the button **Gas System Test**.

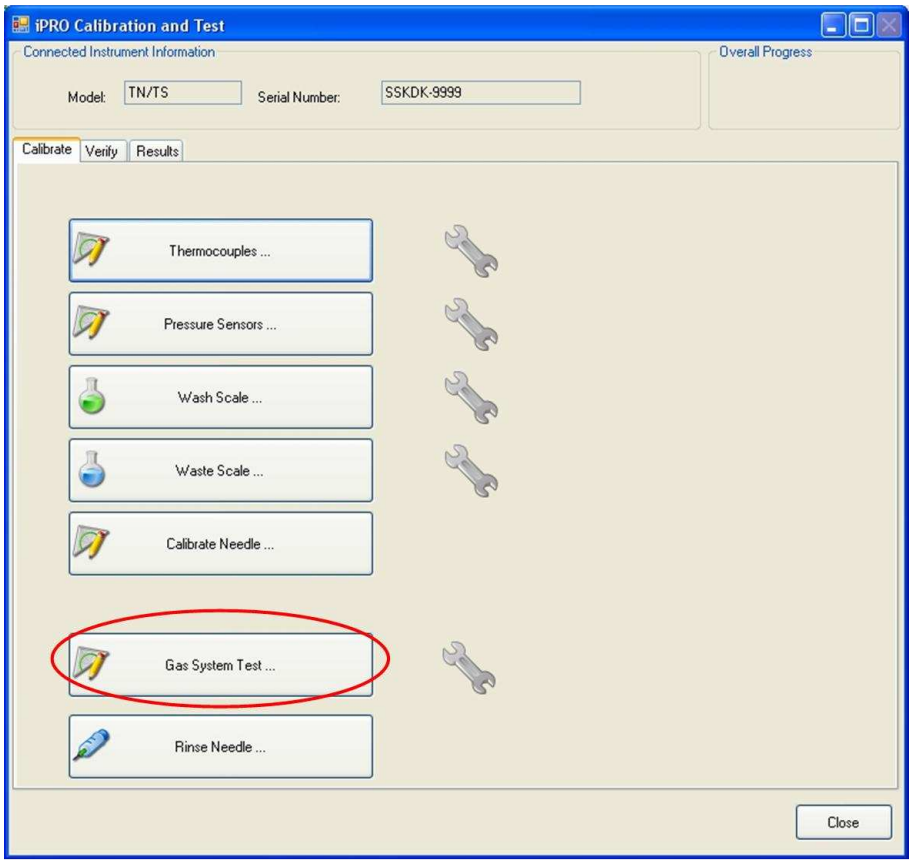


Fig 5.17 Gas System Test

Follow the instructions on the screen. When prompted for using manually blocking the injection port or using the AS3000 II Autosampler, click the **Autosampler** button. The NSX Visual Software will now perform a Gas System Test.

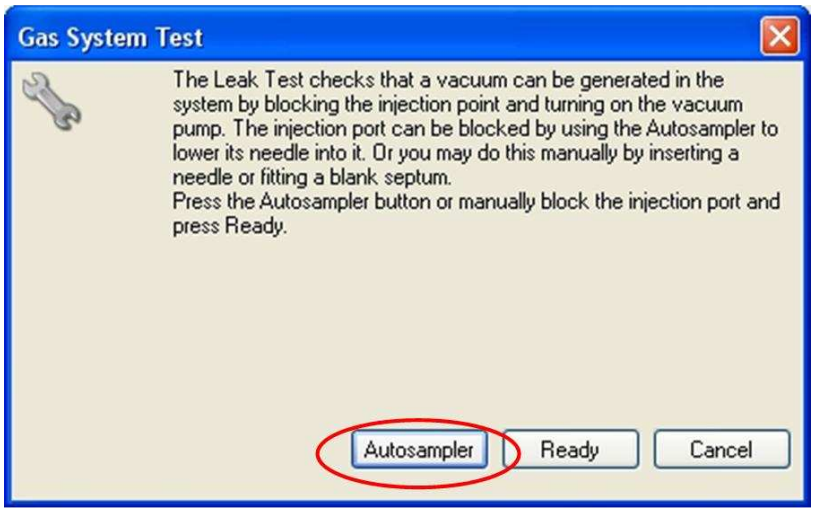

Gas System Test
The Leak Test checks that a vacuum can be generated in the system by blocking the injection point and turning on the vacuum pump. The injection port can be blocked by using the Autosampler to lower its needle into it. Or you may do this manually by inserting a needle or fitting a blank septum.
Press the Autosampler button or manually block the injection port and press Ready.
Autosampler
Ready
Cancel

Fig 5.18 Select Autosampler

If the test fails, the NSX Visual Software and the Diagnostics Guide will provide guidance for solving the problem.

Section completed: ☐

6.16 Perform an Installation Acceptance Test

Perform an Installation Acceptance Test when the iPRO 5000 Series TN/TS Analyzer is ready to use. The iPRO 5000 Series TN/TS Analyzer is ready to use when all actions above are performed and the temperatures are stable. Keep in mind that a fully stabilised instrument may take longer. The range used to test the instrument in the factory is 0-50 mg/L. During an installation the instrument should be tested in the range 0-50 mg/L, calibration standards for this range must be present during the installation. Run the calibration line with three replicates using PANAL0222. The r^2 should be at least 0.995 and the RSDs should be less than 5% (except from the blank).

Make sure you are logged in as **Service** and open the **Service Tests**.

In the tab **Verify** click the button for the Low Range Verification Activity.

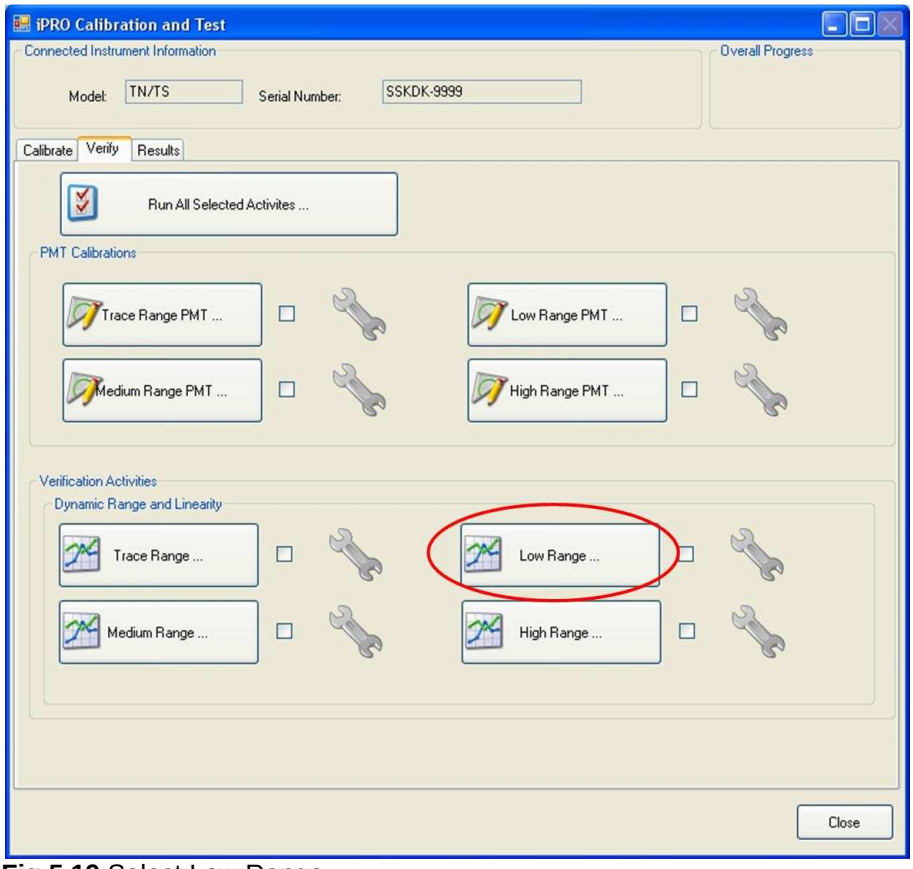


Fig 5.19 Select Low Range

Follow the instructions on the screen.

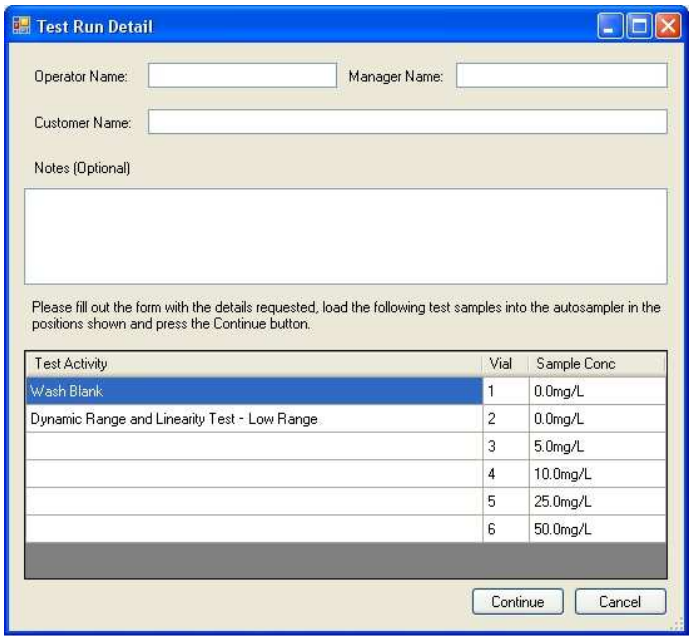


Fig 5.20 Test Run Details

After clicking **Continue**, the NSX Visual Software will execute a verification test for the low range (0 – 50 mg/L) using the same sample introduction method and the same settings (injection volumes, injection speeds, temperatures, etc.) that were used during the Factory Test. The test might use less replicates than the Factory Test in order to save time during installation. The NSX Visual Software will automatically determine Pass or Fail of the verification test based on RSDs and r^2.The verification test will take approximately two hours.

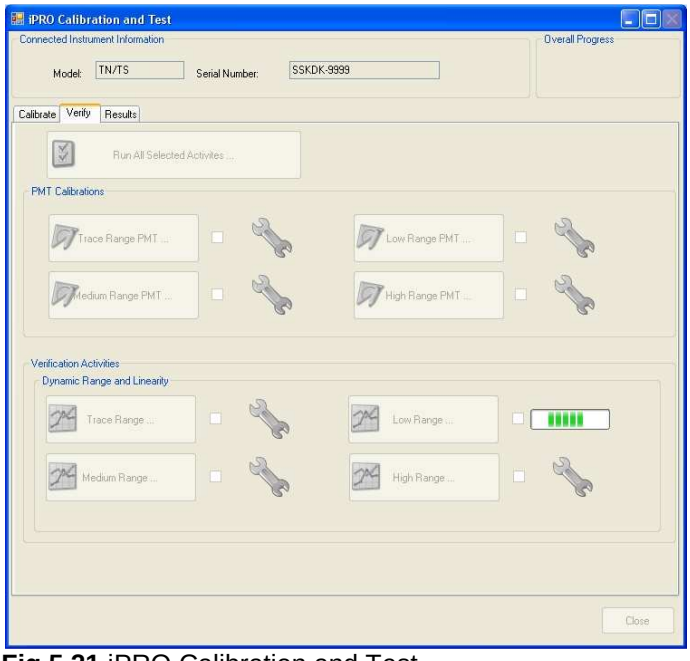


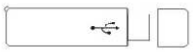
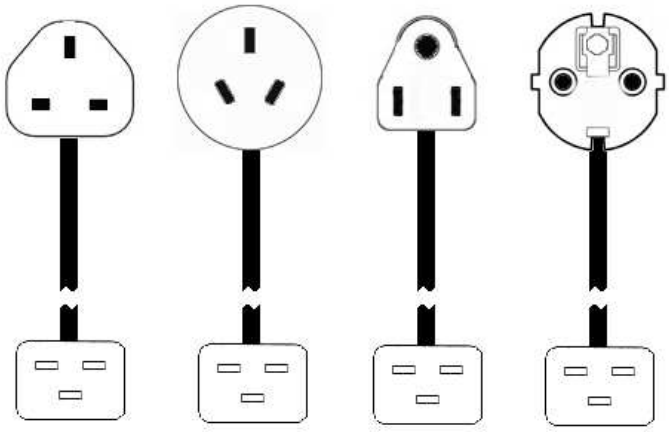
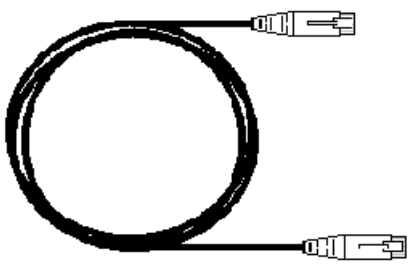
Fig 5.21 iPRO Calibration and Test

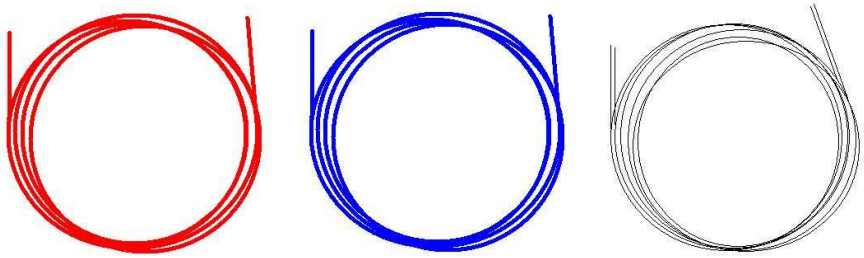
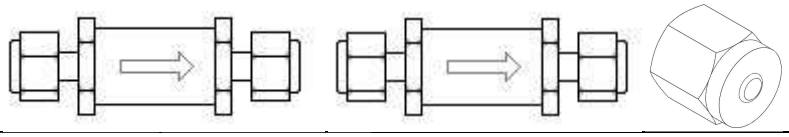
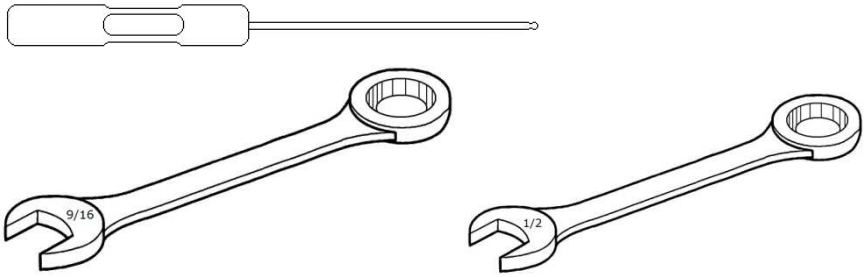
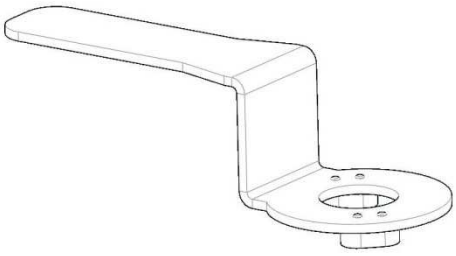
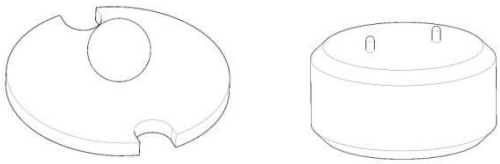
After the test is finished, the results can be viewed in the **Results** tab and a Service Test Report can be exported and/or printed out. The report will include the results of the Gas System Test (Pass/Fail) and the Low Range Verification Test (Pass/Fail).

Section completed:

7 Appendix A: Parts sent with

The following parts will be shipped with a new instrument.

iPRO 5000 Series – Contents of Parts Sent With	
	iPRO 5000 Series Quick Guide User Guides and Installation Guides on Disk
	USB Memory stick
	Mains power leads for iPRO
	Communications cable – iPRO to PC (RJ45)

	Gas tubing Red – argon (1/16 in. x 1/8 in.) Blue – oxygen (1/16 in. x 1/8 in.) Clear – waste (3/16 in. x 1/4 in.)
	In-line filters for gas inputs Blind nut for unused input
	Bottles for wash and waste 125 ml
	Driver (3 mm) and Spanners (1/2 in. and 9/16 in.) for PermaPure removal
	Injector tool
	Glassware removal tool Nozzle tool